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Electromagnetic form factors of baryons in nuclear medium

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The electromagnetic structure of baryons is modified in the nuclear medium.

The modifications can be inferred from the comparison between the electromagnetic form factors in medium with the respective form factor in vacuum.

Of particular interest is the ratio between the electric and magnetic form factors in medium (G_E^*/G_M^*) and vacuum (G_E/G_M) of octet baryons.

The deviation of the double ratios $(G_E^*/G_M^*)/(G_E/G_M)$ from unity measures the impact of the medium modification of the electromagnetic structure in a nuclear medium.

Measurements of the double ratios $(G_E^*/G_M^*)/(G_E/G_M)$ may become available in a near future using the transfer polarization method developed at Jefferson Lab.

We present estimates of the double ratios of octet baryons for different nuclear densities based on a constituent quark model which take into account meson cloud excitations of the baryon cores.

Our results show different features, namely, enhancement or quenching depending on the octet baryon flavor content.

[1] G. Ramalho, J.P.B.C. de Melo, K. Tsushima, Phys.Rev. D100, 014030 (2019).

[2] G. Ramalho, K. Tsushima, A.W. Thomas, J. Phys. G40, 015102 (2013).

In the figure, we present our estimates for the double ratios of the proton and neutron for different nuclear densities.

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